



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/044,358	01/11/2002	John Wasserbauer	47322/PAN/C715/CLO161	8203

3017 7590 08/11/2003
BARLOW, JOSEPHS & HOLMES, LTD.
101 DYER STREET
5TH FLOOR
PROVIDENCE, RI 02903

EXAMINER

KANG, DONGHEE

ART UNIT PAPER NUMBER

2811

DATE MAILED: 08/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/044,358	Applicant(s) WASSERBAUER ET AL. <i>fil</i>	
	Examiner Donghee Kang	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) 3-6,9,10,18,25,26 and 30-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16,17,19-21,23,24 and 27-29 is/are rejected.
- 7) ☒ Claim(s) 1-15 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 May 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Embodiment 5 (Fig.8) in Paper No. 7 is acknowledged. New claims 30-41 have been added. Thus, claims 1-41 are pending in this instant application. Claims 3-6, 9-10,18, 25-26 & 30-41, which are not read on the elected species, are withdrawn form further consideration.

Information Disclosure Statement

2. Acknowledgment is made of receipt of applicant's Information Disclosure Statement (PTO-1449) filed April 15, 2002.

Drawings

3. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on May 30, 2003 have been approved.

Claim Objections

4. Claims 1-2 are objected to because of the following informalities:

Re claim 1, line 2: Claim 7 has a limitation " the optoelectronic further comprising a **second** DBR. So Examiner suggests "a **first** distributed bragg reflector (DBR)" instead of "a distributed bragg reflector (DBR)" to make better form.

Re claim 2, the phrase "the thickness of said first layers" should be "the optical thickness of said first layers".

Re claim 2: the phrase "the optical thickness of said second layer is an **odd integer** multiple of one fourth of the wavelength" is misdescriptive because the odd

integer includes "1, 3, 5...". If the odd integer is "1", the first and second layer have a same optical thickness.

Re claim **16**: Claim 23 has a limitation " the optoelectronic further comprising a **second** DBR. So Examiner suggests "a **first** distributed bragg reflector (DBR)" instead of "a distributed bragg reflector (DBR)" to make better form.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims **16-17, 19-21, 23-24 and 27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lim et al. (US 5,757,837) in view of Mawst et al. (US 6,396,865).

Re Claims **16 & 20-21**, Lim et al. teach an optoelectronic device, comprising (Fig.1):

an active region (26) adjacent a first distributed reflector (36) comprising a plurality of mirror periods comprises a first layer formed from a first material having a first thermal conductivity and a second layer formed from a second material having a second thermal conductivity and, wherein optical thickness ($3\lambda/4$) of at least a portion (38) of said mirror periods is greater than one-half wavelength of light emitted by said optoelectronic device.

Lim et al. noted that the optimization of such DBR mirror stack structure for a particular application is known in the art. However, Lim et al. do not expressly teach the specific properties of the DBR stack mirror such as material (GaAs/AlAs) & optical thickness ($\lambda/4$) etc.

Mawst et al. teach in Fig.1 a mirror stack with mirror pairs in a GaAs/AlAs, wherein AlAs has a thermal conductivity that is greater than that of GaAs. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the mirror stack with mirror pairs in a GaAs/AlAs as taught by Spruytte in Lim's device since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as matter of obvious design choice. In re Leshin, 125 USPQ 416.

Re Claims **17 & 19**, Lim et al. do not expressly teach the optical thickness of DBR. However, Mawst et al. teach the first and second layer of DBR having one fourth ($\lambda/4$) of light emitted by said optoelectronic device (Fig.13). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the thickness of DBR in the range one fourth in Lim's device in order to obtain a desired power of light.

Re Claims **23-25**, Lim et al. teach the optoelectronic device further comprising a second DBR (24), which comprises a plurality of semiconductor mirror layers, adjacent said active region (26).

Re Claim **27**, Lim et al. teach said active region comprising at least one quantum wells.

7. Claims **28-29** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lim et al. (US 5,757,837) in view of Mawst et al. (US 6,396,865) and further in view of Ramdani et al.

Neither Lim nor Mawst teaches the quantum wells comprising GaAs/InGaAsN. Ramdani et al. teach the vertical cavity surface emitting laser having GaAs/InGaAsN quantum wells (23). See abstract.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form active region using GaAs/InGaAsN quantum well in Lim's device since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as matter of obvious design choice. In re Leshin, 125 USPQ 416.

Allowable Subject Matter

8. Claims 1-15 would be allowable if rewritten or amended to overcome the objection and rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Claim 22 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Prior art reference, taken along or in combination, do not teach or render obvious that thickness of said first layers is greater than thickness of said second layers

Art Unit: 2811

for at least said portion of said mirror periods having a thickness greater than one-half the wavelength of light emitted by said optoelectronic device.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 703-305-9147. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Donghee Kang
Examiner
Art Unit 2811

dhk
July 31, 2003